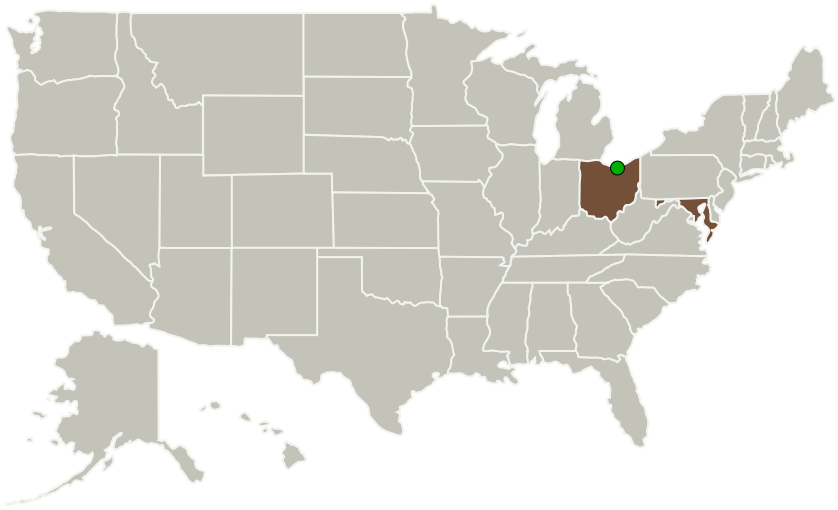
Plug-and-Play Compatibility for CubeSat Attitude Determination and Control Systems, Phase I

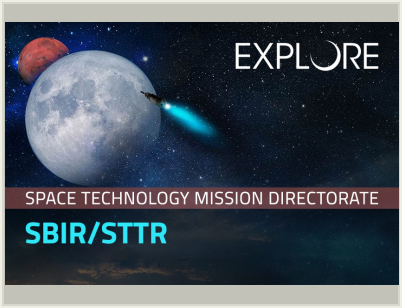
Completed Technology Project (2012 - 2012)

Project Introduction

The development of Plug-and-play Compatibility for CubeSat Attitude Determination and Control Systems (ADACS) is proposed. Existing Maryland Aerospace (MAI) ADACS technologies are well-capable of autonomously providing complete attitude determination and control to satellites weighing up to 20kg. It is essential for these ADACS technologies to be fully compliant with a Plug-and-Play standard that allows them to integrate seamlessly into rapid spacecraft development. One solution for Plug-and-Play is the Space Plug-and-play Architecture (SPA) bus developed by the Air Force Research Laboratory (AFRL), which is currently being adopted by many spacecraft developers for its low-cost, low-power, and simple design. A program for development of the electronics and firmware is outlined to create SPA compatibility technologies for CubeSat and NanoSat ADACS. This technology is significant because not only does it extend the capability of current low cost spacecraft to tactical imaging, space environment monitoring, and other missions requiring precision fine pointing, it provides a tremendous amount of flexibility in spacecraft mission design. Future NASA spacecraft development will no longer have to expend time and energy to develop an attitude solution.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Adcole Maryland Aerospace, LLC	Lead Organization	Industry	Crofton, Maryland
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Maryland	Ohio

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138411)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Adcole Maryland Aerospace, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

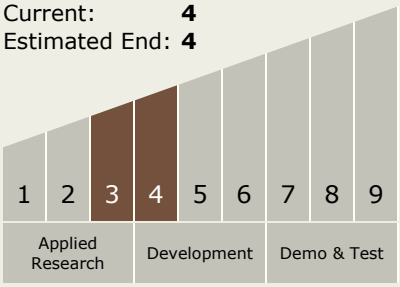
Carlos Torrez

Principal Investigator:

Steve Fujikawa

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
  - TX17.2 Navigation Technologies
    - TX17.2.5 Rendezvous, Proximity Operations, and Capture Sensor Processing and Processors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System